

The Photometric Behavior of Comets Hyakutake (1996 B2) and Hale-Bopp (1995 O1)

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We present analysis of narrowband photometry of Comets Hyakutake (1996 B2) and Hale-Bopp (1995 O1) obtained at Lowell Observatory using the IHW comet filters. Results include production rates measured for OH, NH, CN, C₂, C₃, and a measure of the dust production, $Af\rho$. Photometry of Hyakutake obtained in February and March indicate that the dependence of the gas species with heliocentric distance was initially flat or very shallow but then sharply steepened, while that of the dust, i.e., $\log Af\rho$ vs $\log r$, maintained a near-constant slope of approximately -2.5. Measurements obtained the night of closest approach to Earth (25 March) yield mean production rates ($\log Q(X)$ molecules/sec) of: 28.93 for OH, 26.60 for CN, and 26.78 for C₂. The \log of the dust production was 3.75. Production rates the prior two nights were significantly higher than on the 25th or than would have been predicted based on the long-term trends. The high values on the 23rd and 24th may be related to the "luminous knots" reported by Lecacheux et al. (IAUC 6354) on Mar 23.9-24.2. The ratio of the trace species to water (as measured by OH) classifies this comet as "typical" in our current compositional taxonomy [cf. A'Hearn *et al.*, 1995, *Icarus* **118**, 223-270].

Photometry of Comet Hale-Bopp has been obtained on more than two dozen nights between August 1995 and August 1996. These data, together with anticipated additional observations, will also be presented. This research was supported by NASA.

Abstract submitted for 1996 DPS meeting

Date submitted: LPI electronic form version 5/96

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Special instructions: Tue Aug 27 16:33:15 CDT 1996

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